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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/517,821	12/14/2004	Shinji Inazawa	51023-025	8803
20277 7590 08/21/2007 MCDERMOTT WILL & EMERY LLP 600 13TH STREET, N.W. WASHINGTON, DC 20005-3096			EXAMINER YANG, JIE	
			ART UNIT 1742	PAPER NUMBER
			MAIL DATE 08/21/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/517,821

Applicant(s)

INAZAWA ET AL.

Examiner

Jie Yang

Art Unit

1709

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14/December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 December 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 12/14/2004; 5/4/2006; 9/8/2005.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

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DETAILED ACTION

Regard IDS marked 09/08/2005, it is marked out because it includes duplicate information in IDS marked 05/04/2006. And Foreign references: EP 1120181 A1 listed in IDS marked 12/14/2004 is marked out from present information for same reason.

Acknowledge of the receipt of "applicant argument/remarks" filed on 12/14/2004. Specification has been amended to correct an error in the description of the figures. Claims 1-6 are pending in application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5, are rejected under 35 U.S.C. 103(a) as being unpatentable over Puetter (DE 3300865, thereafter 'DE865) in view of Senda et al (U.S 5435830, thereafter '830).

'DE865 teaches an aqueous TiCl_3 solution is made by cathodic electrolytic reducing of TiCl_4 solution in a cell and the aqueous catholyte prefer contain 0.5-37% HCl and 0.5-45% TiCl_4 . The anolyte prefer contain HCl and TiCl_4 , where the molarity ratio TiCl_4 in anolyte: TiCl_4 in the catholyte is between 1:1.7 and 1.7:1 (Abstract of 'DE865). Because it is an acidic solution,

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the pH is less than 7. Compared with instant invention, 'DE865 disclosed a same aqueous TiCl_3 solution by same cathodic electrolytic method for using as reducing agent in organic chemistry (Title of 'DE865). 'DE865 teaches: "depositing coating on the cathode with borides, silicides, carbides, nitrides and/or oxides of Ti, W Zr, Ta, Nb. The surface coating thickness is 0.01-0.04 mm thick" (Abstract of 'DE865). But DE865 does not explicitly teach using this method to producing fine metal powder.

'830 teaches "An aqueous solution of water soluble compounds or an aqueous solution of water soluble complexes, which is a salt of elements belonging to the 6A, 7A, 1B, 2B, 3B, 4B, 5B, 6B, or 8 group in a periodic table are prepared. The pH of the aqueous solution is adjusted and titanium trichloride is added thereto. The aqueous solution provided with titanium trichloride is stirred at temperature below the boiling point of the solution under atmospheric pressure or under high pressure. Then, by the reducing action of the titanium trichloride, a fine titanium-free powder selected from the group consisting of a metal powder, an alloy powder containing two or more of metals and non-metals, or a compound powder containing two or more of metals and non-metals is obtained" (Abstract of '830). '830 discloses same TiCl_3 -- TiCl_4 oxidation-reduction process as

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instant invention using same materials to producing fine metal powders as discussed above (also refer to Col.2, Line 21-68; embodiment 1-12 and claims 1-3). It would have been obvious to one of ordinary skill in the art to make fine metal powder as demonstrated in '830 in process of 'DE865 to producing fine powders of high purity and reduced grain diameter simply and safely without pollution and at low cost (Col.2, Line 20-25). Claim 1 is rendered obvious by above references.

Regard to claims 2,3 which depended on claim 1, primary reference 'DE865 teach: an aqueous TiCl_3 solution is made by cathodic electrolytic reducing of TiCl_4 solution in a cell and the aqueous catholyte prefer contain 0.5-37% HCl and 0.5-45% TiCl_4 ; The anolyte prefer contain HCl and TiCl_4 . The additional HCl will meet the limitation recited in instant claim, because TiCl_4 solution with out HCl has a 1:4 molar ratio between chlorine ions to tetravalent titanium ions. Refer to the rejection for claim 1, claims 2,3 are rendered obvious by above references.

Regard to claim 4, which depended on claim 1, primary reference 'DE865 does not explicitly teach producing a fine metal powder from specific group of metal. '830 teach an aqueous solution of water soluble complexes, which is a salt of elements chosen from 6A, 7A, 1B, 2B, 3B, 4B, 5B, 6B, or 8 group in a

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periodic table are prepared, and a fine titanium-free powder selected from the group consisting of a metal powder, an alloy powder containing two or more of metals and non-metals, or a compound powder containing two or more of metals and non-metals is obtained (Abstract, Claims 1-18 of '830). Refer to the rejection for claim 1, claim 4 is rendered obvious by above references.

Regard to claim 5, which depended on claim 1, primary reference 'DE865 does not explicitly teach producing a fine metal powder with diameter not more than 400nm. '830 teach 0.1 μm Sn-Pb powder had be obtained (Embodiment 4 - Col.4, Line 1-12) and this gain size less than 400 nm. Refer to the rejection for claim 1, claim 5 is rendered obvious by above references.

Claims 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over 'DE865 in view of '830 as applied on claim 1-5 and further in view of Harrison et al (US 5,409,581, thereafter '581).

Regard to claim 6, which depended on claim 1, 'DE865 and '830 teach the limitations of claim 1, primary reference 'DE865 teaches a process for manufacturing aqueous TiCl_3 solution and allows for regenerating TiCl_4 solutions obtained by using TiCl_3 solution as a reducing agent (Abstract of 'DE865). But 'DE865 does not explicitly teach: "...the solution containing the

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tetravalent titanium ion after the deposition of the fine metal powder is reproduced as the reducing agent solution by the cathode electrolytic treatment, and is repeatedly used for producing the fine metal". '581 teaches a tetravalent titanium electrolyte and trivalent titanium reducing agent obtained thereby (Title of '581). '581 points out: "The electrolytic reduction of titanium (IV) to titanium (III) is well known in acid media, such as hydrochloric, sulphuric, etc" (Col.2, Line 33-36). '581 discloses: "An advantage of the invention is that after the reduction of an organic compound, tetravalent titanium is Converted into tetravalent titanium. It is then possible to recycle the electrolyte into a cell to regenerate the reducing agent consisting of trivalent titanium." (Col.8, Line 35-40). '581 disclosed a same aqueous $TiCl_3$ solution by same cathodic electrolytic method for using as reducing agent in materials reducing application (Abstract of '581). It would have been obvious to one of ordinary skill in the art to choose cathode electrolytic treatment to reproduce the reducing agent solution as demonstrated in '581 in process of 'DE865. Claim 6 is rendered obvious by above references.

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Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure of Hosoe et al (U.S 6,540,811), which indicated the similar methods for producing 1-100 nm fine alloy powders by similar reducing – oxidation process as process recited in instant invention.

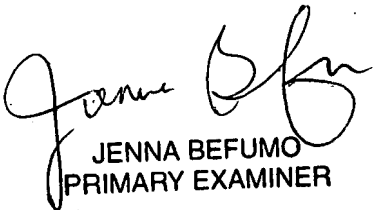
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jie Yang whose telephone number is 571-270-1884. The examiner can normally be reached on M-F, 7:30-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JY




JENNA BEFUMO
PRIMARY EXAMINER